

Aquifer

Restoration

Project

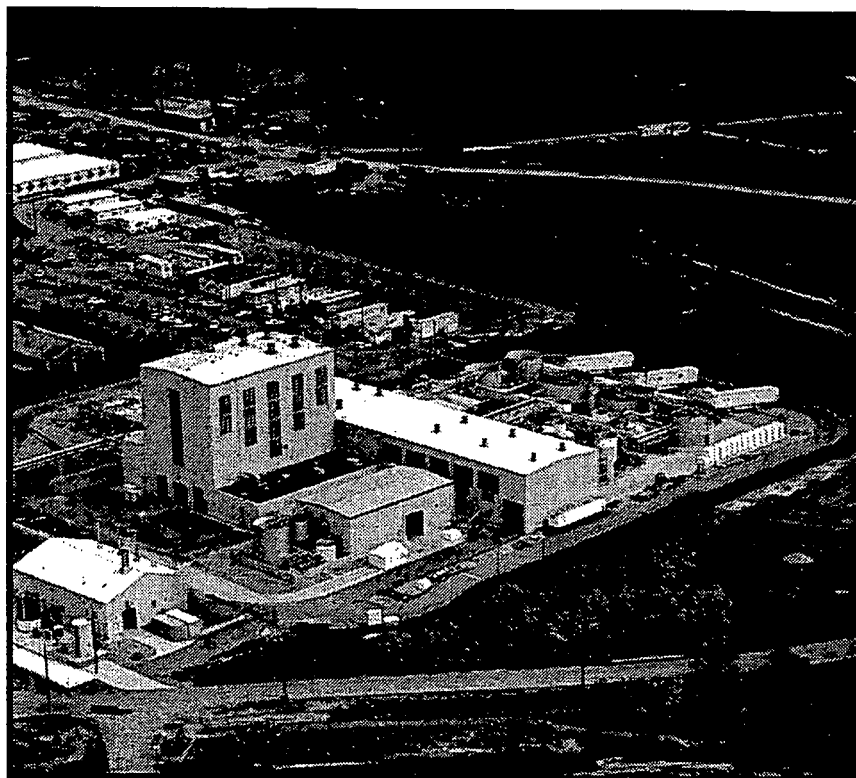
**(Operable
Unit 5)**

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For More Information

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The Advanced Wastewater Treatment Facility is currently being expanded to handle additional groundwater treatment needs beginning in 1998 (6600-134).

Description

Operable Unit 5 is one of five areas being remediated at DOE's Fernald Environmental Management Project (FEMP). Each operable unit was defined based on its location or the potential for similar technologies to be used in the ultimate cleanup.

Operable Unit 5 consists of the remediation of environmental media at the FEMP. The Aquifer Restoration and Wastewater Treatment Project (ARWWP) is that portion of Operable Unit 5 that pertains to the remediation of the affected areas of the Great Miami Aquifer and the treatment of all site wastewater.

Selected Remedy for the Great Miami Aquifer

The remedy for the Great Miami Aquifer is defined in the *Record of Decision for Remedial Actions at Operable Unit 5*, which was signed by the U.S. Environmental Protection Agency (EPA) in January 1996.

To remediate the Great Miami Aquifer, it was planned that areas of groundwater contamination exceeding final remediation levels would be cleaned in 27 years using groundwater extraction and treatment technology, with the understanding that DOE would evaluate appropriate and innovative technologies in an effort to accelerate the aquifer restoration.

As part of the aquifer restoration remedial design effort, the FEMP has completed a design and received U.S. EPA and Ohio EPA approval for an accelerated aquifer restoration strategy (approximately 10 years rather than 27 years). Details of the accelerated aquifer restoration are presented in the *Baseline Remedial Strategy Report, Remedial Design for Aquifer Restoration*.

Achieving the predicted 10-year accelerated aquifer restoration is contingent upon: Sustainability of long-term reinjection of treated groundwater into the aquifer;

— Other operable units completing their accelerated cleanup objectives so earlier surface access is available for additional aquifer remediation wells and piping;

— Accelerated removal of other operable unit source terms contributing to aquifer contamination;

— Geochemical processes that occur in the aquifer behaving as predicted.

A portion of the South Plume Module, has been operating since 1993 and was formerly known as the South Plume Removal Action. The other four modules; Waste Storage, Plant-6, South Field Phase II, and South Field Re-Injection are considered long-term modules, as they are not scheduled to begin operation until the surface remediation in these areas is completed.

Accelerated restoration of the Great Miami Aquifer is planned to be achieved using seven individual remediation modules, each with a distinct well field pattern and installation time frame. Three modules are scheduled to begin operation in 1998: the South Field Phase I, the South Plume Optimization, and the Re-Injection Demonstration Module.

Re-Injection Demonstration

A key component of the accelerated aquifer remediation is the groundwater Re-Injection Demonstration Module. The evaluation of re-injection technology at the FEMP is being sponsored by the DOE's Office of Science and Technology Subsurface Contaminants Focus Area.

The FEMP has determined through groundwater modeling that groundwater re-injection is a potentially viable strategy for enhancing the aquifer remediation. Two short-term, single well re-injection tests were conducted at the FEMP in 1995 and 1996 using temporarily converted extraction wells and temporary piping.

Test results were favorable, but indicated additional data were needed on the long-term maintenance costs and technical viability of a field scale re-injection system before making a commitment to use re-injection as a part of the full-scale groundwater remedy at the FEMP. A one-year groundwater re-injection demonstration is scheduled to begin in 1998.

The Re-injection Demonstration Module will be composed of five re-injection wells located along the southern FEMP property boundary. A test plan for the demonstration is being prepared and will be submitted to U.S. EPA for review and approval in September 1997.

Wastewater Treatment

An extensive system for wastewater conveyance, holding, treatment and discharge has been developed at the FEMP over the past several years to meet treated effluent discharge requirements established in the site's National Pollutant Discharge Elimination System permit and in the Operable Unit 5 record of decision.

The following water treatment facilities are currently operating at the FEMP:

- Advanced Wastewater Treatment Facility (AWWT) Phase I;
- AWWT Phase II;
- Interim Advanced Wastewater Treatment Facility (IAWWT);
- South Plume Interim Treatment (SPIT) System;
- Volatile Organic Compound (VOC) Wastewater Treatment System; and
- Sewage Treatment Plant (STP).

These facilities treat the following categories of wastewater:

- Controlled surface water run-off from the more highly contaminated areas of the FEMP;
- Remediation wastewater;
- Groundwater; and
- Sanitary wastewater.

Combined, these facilities currently treat approximately 50 million gallons of wastewater per month.

A major expansion of the AWWT system is currently under way. This expansion is being completed to handle the additional groundwater treatment needs as the new groundwater remediation wells come online in 1998.

Progress Update

The wells for the South Field Phase I and Re-Injection Demonstration Modules have been installed. Over the next several months, the surface piping and facilities to operate the wells will be constructed. The FEMP has also completed improvements to existing water treatment facilities.

Installation of multimedia filters have increased flow to the treatment facilities and enhanced uranium removal capabilities. A slurry-dewatering system was completed in the fall of 1996 to provide dewatering of sludge from the water treatment processes.

Work on a treatment resin regeneration system is being completed. Work on the expansion of the Advanced Wastewater Treatment Facility (AWWT) continues.

The strategy for operation of the three groundwater restoration modules and associated water treatment facilities is presented in the Operations and Maintenance Master Plan for the Aquifer Restoration and Wastewater Treatment Project.

The initial draft of this plan was submitted to U.S. EPA for review and approval in July 1997. DOE will be working with U.S. EPA during the next few months to finalize the plan.

